

REMARKS

Claims 1-34 are currently pending in the subject application and are presently under consideration. Claims 1, 4-6, 8-10, 12, 14-16, 19, 20, 22, 27, 28 and 31 have been amended as shown on pp. 3-11 of the Reply. Additionally, the specification has been amended as shown on p. 2 of the Reply.

Favorable reconsideration of the subject patent application is respectfully requested in view of the comments and amendments herein.

I. Objection to Drawings

The Examiner has objected to the drawings because, citing MPEP § 608.02(g), Figure 1 should be designated by a legend such as --Prior Art-- since only that which is old is illustrated. This objection should be withdrawn for at least the following reasons. Figure 1 does not illustrate prior art and, thus, does not fall under MPEP § 608.02(g).

Figure 1 illustrates a transmitter and receiver in a wireless communications system. This Figure provides a novel illustration of a wireless communication system because it illustrates how an RX Processor 170 is utilized in the wireless communications system. Figures 3, 4, 5 and 6 each illustrate a variation of the RX Processor, 170a, 170b, 170c and 170d, respectively, that can be employed as the RX Processor 170 in the wireless communications system of Figure 1. See [0035]; [0046]; [0059]; [0080]. Since Figure 1 illustrates novel features of the current invention, it is not prior art. Thus, it is respectfully requested that this objection be withdrawn.

II. Rejection of Claims 1-11 and 16-19 Under 35 U.S.C §112

Claims 1-11 and 16-19 stand rejected under 35 U.S.C §112, first paragraph, as failing to comply with the enablement requirement. Specifically, the disclosure does not indicate how the second data stream is used to enhance the LLRs for the code bits of the first data stream. Independent claims 1 and 16 have been amended, consistent with the specification, to clarify how the second data stream is used to enhance the LLRs for the code bits of the first data stream so that a person skilled in the art can make or use the invention, as indicated above. Therefore, it is respectfully requested that this rejection be withdrawn.

III. Rejection of Claims 12-15 and 31-34 Under 35 U.S.C §112

Claims 12-15 and 31-34 stand rejected under 35 U.S.C §112, first paragraph, as failing to comply with the enablement requirement. Specifically, the disclosure does not indicate how the combination of the second data stream and the first data stream provided to the decoder helps to enhance the decoded data stream. Independent claims 12 and 31 have been amended, consistent with the specification, to clarify how the combination of the second data stream and the first data stream provided to the encoder helps to enhance the decoded data stream so that a person skilled in the art can make or use the invention, as indicated above. Therefore, it is respectfully requested that this rejection be withdrawn.

IV. Rejection of Claims 28-30 Under 35 U.S.C §112

Claims 28-30 stand rejected under 35 U.S.C §112, first paragraph, as failing to comply with the enablement requirement. Specifically, the disclosure does not indicate how the combination of information from the adjustment unit and the decision unit is used to form enhanced data symbol estimates. Independent claim 28 has been amended, consistent with the specification, to clarify how the combination of information from the adjustment unit and the decision unit is used so that a person skilled in the art can make or use the invention, as indicated above. Therefore, it is respectfully requested that this rejection be withdrawn.

V. Rejection of Claims 22-24 and 27 Under 35 U.S.C §112

Claims 22-24 and 27 stand rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, the limitation, “the second data stream is provided with the first data stream to produce an enhanced decoder stream,” is vague and indefinite because it is not clear whether the first and second data streams are combined to produced an enhanced decoded data stream or the second data stream is just obtained from the first data stream to produce an enhanced decoded data stream. Independent claims 22 and 27 have been amended to clarify that the second data stream combined with the first data stream to produce an enhanced decoded data stream, as indicated above. Therefore, it is respectfully requested that this rejection be withdrawn.

VI. Rejection of Claims 1-3, 5-11, 16-18, 20, 21, and 25 Under 35 U.S.C. §103(a)

Claims 1-3, 5-11, 16-18, 20, 21, and 25 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Applicant's background of invention, in view of Bjerke, *et al.* (US 2003/0103584). It is respectfully submitted that this rejection should be withdrawn for at least the following reasons. Bjerke, *et al.* does not teach each and every element of Applicant's invention as recited in the subject claims.

To reject claims in an application under §103, an examiner must establish a *prima facie* case of obviousness. A *prima facie* case of obviousness is established by a showing that the prior art reference (or references when combined) ***must teach or suggest all the claim limitations***. See MPEP §706.02(j). The ***teaching or suggestion to make the claimed combination*** and the reasonable expectation of success ***must be found in the prior art and not based on the Applicant's disclosure***. See *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

The subject claims relate generally to communication, and more specifically to techniques for performing data detection for a hierarchical coded data transmission in a wireless communication system. The current claimed invention is designed to minimize buffering requirements. See [0006]; [0007]. In one embodiment, the base stream is detected based on received symbols and the enhancement stream is detected based on base stream log-likelihood ratios (LLRs). See [0009]; [0057]. To this end, Independent claim 1, as amended, recites, ***a method of performing data detection in a wireless communication system, comprising: deriving log-likelihood ratios (LLRs) for code bits of a first data stream based on received symbols for a data transmission; computing a decoded base stream based on the LLRs for code bits of the first data stream; estimating interference due to the first data stream based on the decoded base stream; deriving enhancement LLRs by subtracting the estimated interference due to the first data stream from the LLRs for the code bits of the first data stream; and computing a decoded enhancement stream based on the enhancement LLRs.***

Bjerke, *et al.* does not disclose these aspects of the subject claim. Instead, Bjerke relates to techniques to iteratively detect and decode data transmitted in a wireless communication system. See [0007]. The invention disclosed by Bjerke, *et al.* utilizes a "daisy chain" computation of LLRs, which can require a significant amount of buffer capacity. See Fig. 4C. Bjerke, *et al.* does not disclose a method that reduces buffer capacity, including, ***computing a***

decoded base stream based on the LLRs for code bits of the first data stream; estimating interference due to the first data stream based on the decoded base stream; deriving enhancement LLRs by subtracting the estimated interference due to the first data stream from the LLRs for the code bits of the first data stream; and computing a decoded enhancement stream based on the enhancement LLRs.

In light of the amendments to independent claim 1, the distinction between the current claimed invention and Bjerke, *et al.* is apparent. No person of ordinary skill in the art would find it obvious to modify the background of the current application to represent the data symbols more conveniently, as suggested by the Office Action. Bjerke, *et al.* provides that LLRs are a convenient way to represent soft decision symbols. See [0087]. Bjerke, *et al.* does not teach or suggest using the LLRs by *computing a decoded base stream based on the LLRs for code bits of the first data stream; estimating interference due to the first data stream based on the decoded base stream; deriving enhancement LLRs by subtracting the estimated interference due to the first data stream from the LLRs for the code bits of the first data stream; and computing a decoded enhancement stream based on the enhancement LLRs.* Therefore, it would not be obvious to one of ordinary skill in the art to combine the Applicants' background of the invention with Bjerke, *et al.*

Similarly, independent claim 12, as amended, recites, *an apparatus for a wireless communication system, comprising; means for deriving log-likelihood ratios (LLRs) for code bits of a first data stream based on received symbols for a data transmission; means for computing a decoded base stream based on the LLRs for code bits of the first data stream received from the LLR deriving means; means for estimating interference due to the first data stream based on the decoded base stream; means for deriving enhancement LLRs by subtracting the estimated interference due to the first data stream from the LLRs for the code bits of the first data stream; and means for computing a decoded enhancement stream based on the enhancement LLRs.* As discussed *supra*, no person of ordinary skill in the art would find it obvious to modify the background of the current application to represent the data symbols more conveniently, as suggested by the Office Action. Bjerke, *et al.* provides that LLRs are a convenient way to represent soft decision symbols. See [0087]. Bjerke, *et al.* does not teach or suggest means for using the LLRs, such as, *means for computing a decoded base stream based on the LLRs for code bits of the first data stream received from the LLR deriving means; means for estimating*

interference due to the first data stream based on the decoded base stream; means for deriving enhancement LLRs by subtracting the estimated interference due to the first data stream from the LLRs for the code bits of the first data stream; and means for computing a decoded enhancement stream based on the enhancement LLRs. Therefore, it would not be obvious to one of ordinary skill in the art to combine the Applicants' background of the invention with Bjerke, *et al.*

Likewise, independent claim 20 provides an alternate technique for performing data detection for a hierarchical coded data transmission in a wireless communication system while minimizing buffering requirements. See [0010]. To this end, independent claim 20 recites, *a method of performing data detection in a wireless communication system, comprising: deriving log-likelihood ratios (LLRs) for code bits of a first data stream based on received symbols for a data transmission; deriving uncoded data symbol estimates for the first data stream based on either the received symbols or the LLRs for the code bits of the first data stream; computing a decoded stream based on at least one of the received symbols and the LLRs for the code bits of the first data stream using a set of modules; estimating the interference due to the first data stream based on the uncoded data symbol estimates; and deriving LLRs for code bits of a second data stream based on the received symbols and the estimated interference; wherein the second data stream is provided to the modules to produce an enhanced decoded data stream.* With this technique, enhancement-stream LLRs are computed from received symbols, but the interference due to the base stream is estimated based on *uncoded data symbol estimates* instead of the remodulated symbols. See [0072]. *Uncoded data symbol estimates* are found by subtracting interference estimates from the received symbols. See [0079]. *Uncoded data symbol estimates* are, thus, not equivalent to decoded data symbols as used in the Office Action.

As discussed *supra*, no person of ordinary skill in the art would find it obvious to modify the background of the current application to represent the data symbols more conveniently. Bjerke, *et al.* provides that LLRs are a convenient way to represent soft decision symbols. See [0087]. Bjerke, *et al.* does not teach or suggest using the LLRs by *computing a decoded stream based on at least one of the received symbols and the LLRs for the code bits of the first data stream using a set of modules; estimating the interference due to the first data stream based on the uncoded data symbol estimates; and deriving LLRs for code bits of a second data stream based on the received symbols and the estimated interference; wherein the second data*

stream is provided to the modules to produce an enhanced decoded data stream. Therefore, it would not be obvious to one of ordinary skill in the art to combine the Applicants' background of the invention with Bjerke, *et al.*

In view of at least the foregoing, it is respectfully submitted that Bjerke, *et al.* does not teach or suggest each and every feature set forth in amended independent claims 1, 16 and 20 (and claims 2,3, 5-11, 17, 18, 21 and 25 depending there from), and as such fails to make obvious the subject invention. It is therefore requested that this rejection be withdrawn.

VII. Rejection of Claims 4, 19, and 26 Under 35 U.S.C. §103(a)

Claims 4, 19, and 26, which depend from independent claims 1, 16 and 20, respectively, stand rejected under 35 U.S.C. §103(a) as being unpatentable over Applicant's background of invention and Bjerke, *et al.* (US 2003/0103584), further in view of Maru (US 6,516,444). Bjerke, *et al.* and Maru, either alone or in combination, do not disclose each and every element of the subject claims.

For the reasons described *supra*, Bjerke, *et al.* does not teach or suggest every element of independent claims 1, 16 and 20, from which claims 4, 19 and 26 depend. Additionally, for the reasons described *supra*, it would not be obvious to one of ordinary skill in the art to combine the Applicants' background of the invention with Bjerke, *et al.*

Maru teaches a turbo-code decoder, a decoding scheme having higher performance than that of soft-decision Viterbi decoding, in a form suitable for a mobile information terminal represented by a portable telephone so as to provide a high-speed turbo-code decoder with low power consumption. *See* col. 1, lines 35-41. This allows turbo-codes to be applied to a portable telephone in consideration of wide band multimedia communication. Even with these advantages, Maru does not make up for the deficiencies in Bjerke, *et al.* with respect to independent claims 1, 16 and 20.

In view of at least the foregoing, it is respectfully submitted that Bjerke, *et al.* and Maru, both alone and in combination, do not teach or suggest each and every feature set forth in amended independent claims 1, 16 and 20, and as such fails to make obvious the subject invention. It is therefore requested that this rejection be withdrawn with respect to claims 4, 19 and 26.

CONCLUSION

The present application is believed to be in condition for allowance in view of the above comments and amendments. A prompt action to such end is earnestly solicited.

Please charge any fees or overpayments that may be due with this response to Deposit Account No. 17-0026.

Should the Examiner believe a telephone interview would be helpful to expedite favorable prosecution, the Examiner is invited to contact applicants' undersigned representative at the telephone number below.

Dated: 11/24/2008

Respectfully submitted,

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